

GALVALUME FACTS

Soldering

Although GALVALUME® steel sheet can be soldered, the presence of a thin film of aluminum oxide on the surface makes soldering more difficult than when soldering galvanized products. When soldering is necessary, the techniques and fluxes used to solder aluminum should be used.

Welding

GALVALUME® steel sheet can be welded by conventional resistance and arc welding processes. The safety precautions are similar to those for hot-dip galvanized sheet. Because the surface contact resistance is low when compared with uncoated sheet, resistance welding of GALVALUME® steel sheet requires welding currents, welding times and electrode forces higher than those required for similar thicknesses of uncoated cold rolled steel. These welding parameters are similar to those normally used on galvanized steel. However, experience has shown that even more frequent electrode dressing is required, as compared with galvanized sheet, to achieve good welds.

There is less fuming when welding GALVALUME® steel sheet than when welding galvanized sheet. The coating contains less zinc than a comparably thick galvanized coating. Nevertheless, adequate ventilation is required to remove the zinc oxide fumes.

Fastening

From a mechanical standpoint, any style of fastener suitable for use with sheet metal can be used to join GALVALUME® steel sheet to itself or to other parts, provided the fastener design is appropriate for the structural requirement of the application. The list of acceptable devices includes common fasteners like nuts and bolts, screws and rivets of all types, and special types like clamp fasteners, clips and blind screws. Corrosion characteristics of the fastener material should be carefully considered from two standpoints. First, the fastener should be equally as corrosion resistant as the GALVALUME® coating to ensure long life of the fabricated product. Second, the fastener material should be compatible with the coating; that is, it should be selected to avoid accelerated corrosion caused by intimate contact between certain types of dissimilar metals.

Suitable fasteners include those made of nylon, other plastics or stainless steels, and carbon steel fasteners with thick zinc alloy heads. Galvanized and other plated fasteners are acceptable, but their corrosion resistance must be compatible with that of the GALVALUME® steel sheet. Often, the plated coating on these types of fastener is too thin to offer comparable corrosion resistance.

Fasteners made of lead or copper must never be used because they seriously reduce the corrosion resistance of the GALVALUME® coating.

Adhesive Bonding

Adhesive bonding is a proven technique that can join steel effectively to many

materials. It can be used to provide special design capabilities that heretofore were not possible. GALVALUME® steel sheet can be fastened readily by adhesive bonding in the same way and with the same adhesives as hot-dip galvanized sheet.

Sealants

Sealants are often used between overlapping areas of steel sheet to form watertight joints and to achieve superior environmental durability. Neutral-cure silicone rubber sealants are recommended for use with GALVALUME® steel sheet. These materials need no primer. They are flexible and non-corrosive as well as resistant to heat, cold, water and ultraviolet rays. In selecting a silicone rubber sealant, avoid those materials that contain acetic acid or amines, which can promote corrosion during the early stages of curing.

Other types of sealants, like butyl rubber and styrene butadiene rubber, also may be used successfully.

Painting

As stated previously, U. S. Steel GALVALUME® steel sheet provides excellent long-term durability. Therefore, unlike galvanized sheet which exhibits a longer life when painted, the application of paint to the surface of GALVALUME® steel sheet is not needed to achieve long term high performance.

If color is desired for decorative or aesthetic purposes, GALVALUME® steel sheet can be readily painted either before prepainted steel sheet or after fabrication. For prepainted product, the optimum types of paint line pretreatments and primers may be different than those developed for galvanized product. The development of technology related to coil-line painting of GALVALUME® steel sheet has evolved to such an extent that prepainted GALVALUME® sheet is preferred by many customers today especially for environments that involve aggressive corrosion.

When prepainted GALVALUME® steel sheet is properly coil-line painted and rollformed, it has been shown to perform exceptionally well in the field. Issues that were problematic during the initial 5 to 10 years of the product's use have been solved as long as certain details of manufacture and use are obeyed. For example, edge creep (undercutting of the paint coating along sheared edges) which was an initial concern is no longer a problem. Similarly, staining at tension bends on the rollformed panels is not encountered as long as the product is manufactured and subsequently rollformed using prescribed paints and controlled bending during fabrication.

One special precaution applies to prepainted GALVALUME® steel sheet. If the edges of the rollformed panels are exposed to the environment during application (nonlock-seamed panels), the GALVALUME® steel sheet should not be side-trimmed before painting. Good field performance requires that the edges be metallic-coated.

For painting after fabrication, the techniques used for painting galvanized sheet will perform well with GALVALUME® steel sheet. Typically, painting after fabrication requires cleaning to remove dirt and oils, treating to provide improved paint adhesion and corrosion resistance. Consultation with paint suppliers who specialize in the painting of metal is recommended.

